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09/93/850

PATENT COOPERATION TREATY

PCT

REC'D 12 NOV 2001  
PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>YWC/99357629</b>		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/SG 99/00037</b>	International filing date (day/month/year) <b>18 March 1999 (18.03.1999)</b>	Priority Date (day/month/year)	
International Patent Classification (IPC) or national classification and IPC <b>IPC<sup>7</sup>: G06F 13/00, 15/177</b>		<b>RECEIVED</b> <b>JAN 14 2002</b>	
Applicant <b>Kent Ridge Digital Labs et al.</b>		<b>Technology Center 2100</b>	

1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I. ☒ Basis of the opinion
- II. ☐ Priority
- III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV. ☐ Lack of unity of invention
- V. ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI. ☐ Certain documents cited
- VII. ☐ Certain defects in the international application
- VIII. ☐ Certain observations on the international application

Date of submission of the demand <b>15 October 2000 (15.10.2000)</b>	Date of completion of this report <b>18 June 2001 (18.06.2001)</b>
Name and mailing address of the IPEA/AT <b>Austrian Patent Office Kohlmarkt 8-10 A-1014 Vienna Facsimile No. 1/53424/200</b>	Authorized officer <b>WERNER</b>  Telephone No. 1/53424/357

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SG 99/00037

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed“ and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**International application No.  
PCT/SG 99/00037**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement			
Novelty (N)	Claims	1-18	YES
	Claims		NO
Inventive step (IS)	Claims	1-18	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims		NO

## Citations and explanations (Rule 70.7)

The following documents have been cited in the Search Report:

D1: US5421009A  
D2: WO96/24231A1  
D3: US5845077A1  
D4: US5881236A  
D5: JP10-269078A

The documents cited in the search report disclose the state of the art merely.  
An inventive step is involved and industrial applicability obviously is given.

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ AT

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:  
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only		15 October 2000 (15.10.00)
AUSTRIAN PATENT OFFICE Identification of IPEA		Date of receipt of DEMAND
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or agent's file reference
International application No. PCT/SG 99/00037	International filing date (day/month/year) 18 March 1999 (18-03-1999)	(Earliest) Priority date (day/month/year) N.A.
Title of invention SOFTWARE DISTRIBUTION, EXECUTION AND UPGRADING		
<b>Box No. II APPLICANT(S)</b>		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) KENT RIDGE DIGITAL LABS 21 Heng Mui Keng Terrace SINGAPORE 119613 REPUBLIC OF SINGAPORE		Telephone No.: (65) 874-7588
		Facsimile No.: (65) 776-8109
		Teleprinter No.: N.A.
State (that is, country) of nationality: SG	State (that is, country) of residence: SG	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) RANGARAJAN, SRIDHARAN Block 379, Clementi Avenue 5 #02-348 SINGAPORE 120379 REPUBLIC OF SINGAPORE		
State (that is, country) of nationality: IN	State (that is, country) of residence: SG	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) LIN, FENG Block 110, Woodlands Street 13 #12-20 SINGAPORE 730110 REPUBLIC OF SINGAPORE		
State (that is, country) of nationality: CN	State (that is, country) of residence: SG	
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.		

## Continuation of Box No. II APPLICANT(S)

*If none of the following sub-boxes is used, this sheet should not be included in the demand.*

Name and address: *(Family name followed by given name; for a legal entity: full official designation. The address must include postal code and name of country.)*

PANG, HWEE HWA  
19 Shelford Road  
#01-42  
SINGAPORE 288408  
REPUBLIC OF SINGAPORE

State *(that is, country)* of nationality: SG

State *(that is, country)* of residence: SG

Name and address: *(Family name followed by given name; for a legal entity: full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

Name and address: *(Family name followed by given name; for a legal entity: full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

Name and address: *(Family name followed by given name; for a legal entity: full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

☐ Further applicants are indicated on another continuation sheet.

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The following person is ☒ agent ☐ common representative

and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.

☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

HELEN YEO & PARTNERS  
80 Raffles Place  
#33-00 UOB Plaza 1  
SINGAPORE 048624

Telephone No.:

(65) 2161-609 (DID)

Facsimile No.:

(65) 557-2322

Teleprinter No.:

N.A.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed  
the description ☐ as originally filed

☐ as amended under Article 34

the claims ☐ as originally filed

☐ as amended under Article 19 (together with any accompanying statement)

☐ as amended under Article 34

the drawings ☐ as originally filed

☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: ENGLISH

☒ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☐ which is the language of publication of the international application.

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT)

excluding the following States which the applicant wishes not to elect:

## Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |  |                |
|--|----------------|
| 1. translation of international application                              | sheets         |
| 2. amendments under Article 34   | sheets         |
| 3. copy (or, where required, translation) of amendments under Article 19 | sheets         |
| 4. copy (or, where required, translation) of statement under Article 19  | sheets         |
| 5. letter  | 1 (one) sheets |
| 6. other (specify)   | sheets         |

For International Preliminary Examining Authority use only


received	not received
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (specify):  |

## Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

  
YEW WOON CHOOI (Ms)  
Agent for the applicants  
HELEN YEO & PARTNERS

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND: 15 October 2000 (15.10.00)

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:



## PCT

## FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

International application No. <span style="float: right;">PCT/SG 99/00037</span> <hr/> Applicant's or agent's file reference <span style="float: right;">YWC/99357629</span> <hr/> Applicant <div style="text-align: center;">KEN RIDGE DIGITAL LABS and 3 others</div> <hr/> <div style="border: 1px solid black; padding: 5px;"> <b>Calculation of prescribed fees</b>           1. Preliminary examination fee ..... <span style="border: 1px solid black; padding: 2px 10px;">2,200</span> <span style="border: 1px solid black; padding: 2px 5px;">P</span>           2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i> ..... <span style="border: 1px solid black; padding: 2px 10px;">2,022.76</span> <span style="border: 1px solid black; padding: 2px 5px;">H</span>           3. Total of prescribed fees          Add the amounts entered at P and H          and enter total in the TOTAL box ..... <span style="border: 1px solid black; padding: 2px 10px;">4,222.76</span>  <div style="border: 1px solid black; padding: 2px 10px; text-align: center;">TOTAL</div> </div> <hr/> <div style="border: 1px solid black; padding: 5px;"> <b>Mode of Payment</b>   <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)  <input type="checkbox"/> cheque  <input type="checkbox"/> postal money order  <input type="checkbox"/> bank draft             </div> <div style="width: 45%;"> <input type="checkbox"/> cash  <input type="checkbox"/> revenue stamps  <input type="checkbox"/> coupons  <input checked="" type="checkbox"/> other (specify): transfer to postal check account at.  <div style="text-align: center;">Oesterreichische Postsparkasse in Vienna (No. 05160.000)</div> </div> </div> </div> <hr/> <div style="border: 1px solid black; padding: 5px;"> <b>Deposit Account Authorization</b> <i>(this mode of payment may not be available at all IPEAs)</i>          The IPEA/ _____ <input type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account.   <input type="checkbox"/> <i>(this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.       </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">         For International Preliminary Examining Authority use only           Date stamp of the IPEA       </div> <div style="border: 1px solid black; height: 200px; margin-top: 10px;"></div>
--	--

Deposit Account Number \_\_\_\_\_

Date (day/month/year) \_\_\_\_\_

Signature \_\_\_\_\_

*See Notes to the fee calculation sheet*

# PATENT COOPERATION TREATY

287872000

From the INTERNATIONAL SEARCHING AUTHORITY

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:

HELEN YEO & PARTNERS  
11 Collyer Quay  
#12-01 The Arcade  
SINGAPORE 049317  
REPUBLIC OF SINGAPORE

Date of mailing  
(day/month/year) 23 August 2000 (23.08.00)

Applicant's or agent's file reference

YWC/99357629

**FOR FURTHER ACTION** See paragraphs 1 and 4 below

International application No.

PCT/SG 99/00037

International filing date (day/month/year)

18 March 1999 (18.03.99)

Applicant

KENT RIDGE DIGITAL LABS et al.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

#### Filing of amendments and statements under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.
3. ☐ With regard to the protest against payment of (an) initial fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the text of both the protest decision thereon to the designated Offices
  - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis. 1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the IPEA/AT

Austrian Patent Office

Kohlmarkt 8-10

A-1014 Vienna

Facsimile No. 1/53424/200

Form PCT/ISA/220 (July 1998)

Authorized officer

Koch

Telephone No. +43 / 1 / 53424 - 450

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>YWC/99357629</b>	FOR FURTHER ACTION      see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/SG 99/00037</b>	International filing date (day/month/year) <b>18 March 1999 (18.03.1999)</b>	(Earliest) Priority Date (day/month/year)
Applicant <b>KENT RIDGE DIGITAL LABS et al.</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

#### 1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.: 3

☒ as suggested by the applicant.

☐ None of the figures.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SG 99/00037

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: G 06 F 13/00, 15/177

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: G 06 F; H 04 L; H 04 Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5421009 A (HEWLETT-PACKARD) 30 May 1995 (30.05.95) abstract	1-6,13-18
A	WO 96/24231 A1 (ERICSSON) 8 August 1996 (08.08.96) totality.	1-18
A	US 5845077 A1 (MICROSOFT) 1 December 1998 (01.12.98) abstract.	1-6,13-18
A	US 5881236 A (HEWLETT-PACKARD) 9 March 1999 (09.03.99) abstract.	1-6
A	JP 10-269078 A (TOSHIBA K.K.) 9 October 1998 (09.10.98) abstract.	1-6
	----	

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

### \* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

23 August 2000 (23.08.2000)

Date of mailing of the international search report

23 August 2000 (23.08.2000)

Name and mailing address of the ISA/AT

Austrian Patent Office

Kohlmarkt 8-10; A-1014 Vienna

Facsimile No. 1/53424/535

Authorized officer

Werner

Telephone No. 1/53424/357

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG 99/00037

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
JP	A2	10269078	09-10-1998	none			
US	A	5421009	30-05-1995	none			
US	A	5845077	01-12-1998	US	A	6073214	06-06-2000
US	A	5881236	09-03-1999	DE	A1	19714521	06-11-1997
				JP	A2	10091454	10-04-1998
				AU	A1	46379/96	21-08-1996
WO	A1	9624231	08-08-1996	AU	B2	702231	18-02-1999
				CA	AA	2211733	08-08-1996
				EP	A1	807363	19-11-1997
				FI	A0	973143	29-07-1997
				FI	A	973143	29-09-1997
				JP	T2	11501136	26-01-1999

## PATENT COOPERATION TREATY

29/12/2000



PCT

INFORMATION CONCERNING ELECTED  
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

To:

HELEN YEO & PARTNERS  
80 Raffles Place  
#33-00 UOB Plaza 1  
Singapore 048624  
SINGAPOUR

Date of mailing (day/month/year) 15 December 2000 (15.12.00)		
Applicant's or agent's file reference YMC/99357629		IMPORTANT INFORMATION
International application No. PCT/SG99/00037	International filing date (day/month/year) 18 March 1999 (18.03.99)	
Priority date (day/month/year)		
Applicant KENT RIDGE DIGITAL LABS et al		

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE  
National : JP, US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

National : SG

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 740.14.35	Authorized officer:  Juan Cruz  Telephone No. (41-22) 338.83.38
--	---

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 15 December 2000 (15.12.00)	
<b>International application No.</b> PCT/SG99/00037	<b>Applicant's or agent's file reference</b> YMC/99357629
<b>International filing date</b> (day/month/year) 18 March 1999 (18.03.99)	<b>Priority date</b> (day/month/year)
<b>Applicant</b> RANGARAJAN, Sridharan et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
 15 October 2000 (15.10.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b> Juan Cruz Telephone No.: (41-22) 338.83.38
--	--

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum)

YWC/99357629

<b>Box No. I</b>	<b>TITLE OF INVENTION</b> SOFTWARE DISTRIBUTION, EXECUTION AND UPGRADING		
<b>Box No. II</b>	<b>APPLICANT</b>		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)  KENT RIDGE DIGITAL LABS 21 Heng Mui Keng Terrace SINGAPORE 119613 REPUBLIC OF SINGAPORE		<input type="checkbox"/> This person is also inventor.  Telephone No. (65) 874 7588  Facsimile No. (65) 776 8109  Teleprinter No. N. A.	
State (that is, country) of nationality: SG		State (that is, country) of residence: SG	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box			
<b>Box No. III</b>	<b>FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)</b>		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)  RANGARAJAN, SRIDHARAN Block 379, Clementi Avenue 5 #02-348 SINGAPORE 120379		This person is:  <input type="checkbox"/> applicant only  <input checked="" type="checkbox"/> applicant and inventor  <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)	
State (that is, country) of nationality: IN		State (that is, country) of residence: SG	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box			
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.			
<b>Box No. IV</b>	<b>AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE</b>		
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  HELEN YEO & PARTNERS 11 Collyer Quay #12-01 The Arcade SINGAPORE 049317 REPUBLIC OF SINGAPORE		Telephone No. (65) 4221-609 (DID)  Facsimile No. (65) 225-1586  Teleprinter No. N. A.	
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.			

See Notes to the request form



Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

LIN, FENG  
Block 110, Woodlands Street 13  
#12-20  
SINGAPORE 730110  
REPUBLIC OF SINGAPORE

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
CN

State (that is, country) of residence:  
SG

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

PANG, HWEE HWA  
19 Shelford Road  
#01-42  
SINGAPORE 288408  
REPUBLIC OF SINGAPORE

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
SG

State (that is, country) of residence:  
SG

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☐ **AP** ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ **EA** Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA** OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |   |   |
|---|---|
| <input type="checkbox"/> AL Albania .....                               | <input type="checkbox"/> LS Lesotho .....                                   |
| <input type="checkbox"/> AM Armenia .....                               | <input type="checkbox"/> LT Lithuania .....                                 |
| <input type="checkbox"/> AT Austria .....                               | <input type="checkbox"/> LU Luxembourg .....                                |
| <input type="checkbox"/> AU Australia .....                             | <input type="checkbox"/> LV Latvia .....                                    |
| <input type="checkbox"/> AZ Azerbaijan .....                            | <input type="checkbox"/> MD Republic of Moldova .....                       |
| <input type="checkbox"/> BA Bosnia and Herzegovina .....                | <input type="checkbox"/> MG Madagascar .....                                |
| <input type="checkbox"/> BB Barbados .....                              | <input type="checkbox"/> MK The former Yugoslav Republic of Macedonia ..... |
| <input type="checkbox"/> BG Bulgaria .....                              | <input type="checkbox"/> MN Mongolia .....                                  |
| <input type="checkbox"/> BR Brazil .....                                | <input type="checkbox"/> MW Malawi .....                                    |
| <input type="checkbox"/> BY Belarus .....                               | <input type="checkbox"/> MX Mexico .....                                    |
| <input type="checkbox"/> CA Canada .....                                | <input type="checkbox"/> NO Norway .....                                    |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein .....  | <input type="checkbox"/> NZ New Zealand .....                               |
| <input type="checkbox"/> CN China .....                                 | <input type="checkbox"/> PL Poland .....                                    |
| <input type="checkbox"/> CU Cuba .....                                  | <input type="checkbox"/> PT Portugal .....                                  |
| <input type="checkbox"/> CZ Czech Republic .....                        | <input type="checkbox"/> RO Romania .....                                   |
| <input type="checkbox"/> DE Germany .....                               | <input type="checkbox"/> RU Russian Federation .....                        |
| <input type="checkbox"/> DK Denmark .....                               | <input type="checkbox"/> SD Sudan .....                                     |
| <input type="checkbox"/> EE Estonia .....                               | <input type="checkbox"/> SE Sweden .....                                    |
| <input type="checkbox"/> ES Spain .....                                 | <input checked="" type="checkbox"/> SG Singapore .....                      |
| <input type="checkbox"/> FI Finland .....                               | <input type="checkbox"/> SI Slovenia .....                                  |
| <input type="checkbox"/> GB United Kingdom .....                        | <input type="checkbox"/> SK Slovakia .....                                  |
| <input type="checkbox"/> GD Grenada .....                               | <input type="checkbox"/> SL Sierra Leone .....                              |
| <input type="checkbox"/> GE Georgia .....                               | <input type="checkbox"/> TJ Tajikistan .....                                |
| <input type="checkbox"/> GH Ghana .....                                 | <input type="checkbox"/> TM Turkmenistan .....                              |
| <input type="checkbox"/> GM Gambia .....                                | <input type="checkbox"/> TR Turkey .....                                    |
| <input type="checkbox"/> HR Croatia .....                               | <input type="checkbox"/> TT Trinidad and Tobago .....                       |
| <input type="checkbox"/> HU Hungary .....                               | <input type="checkbox"/> UA Ukraine .....                                   |
| <input type="checkbox"/> ID Indonesia .....                             | <input type="checkbox"/> UG Uganda .....                                    |
| <input type="checkbox"/> IL Israel .....                                | <input checked="" type="checkbox"/> US United States of America .....       |
| <input type="checkbox"/> IN India .....                                 | <input type="checkbox"/> UZ Uzbekistan .....                                |
| <input type="checkbox"/> IS Iceland .....                               | <input type="checkbox"/> VN Viet Nam .....                                  |
| <input checked="" type="checkbox"/> JP Japan .....                      | <input type="checkbox"/> YU Yugoslavia .....                                |
| <input type="checkbox"/> KE Kenya .....                                 | <input type="checkbox"/> ZW Zimbabwe .....                                  |
| <input type="checkbox"/> KG Kyrgyzstan .....                            |   |
| <input type="checkbox"/> KP Democratic People's Republic of Korea ..... |   |
| <input type="checkbox"/> KR Republic of Korea .....                     |   |
| <input type="checkbox"/> KZ Kazakhstan .....                            |   |
| <input type="checkbox"/> LC Saint Lucia .....                           |   |
| <input type="checkbox"/> LK Sri Lanka .....                             |   |
| <input type="checkbox"/> LR Liberia .....                               |   |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☐ .....
- ☐ .....
- ☐ .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

See Notes to the request form

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1)				
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA /AT

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year) Number Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING

<p>This international application contains the following number of sheets:</p> <p>request : 4</p> <p>description (excluding sequence listing part) : 10</p> <p>claims : 4</p> <p>abstract : 1</p> <p>drawings : 3</p> <p>sequence listing part of description : -</p> <p>Total number of sheets : 22</p>	<p>This international application is accompanied by the item(s) marked below:</p> <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> fee calculation sheet</li> <li><input checked="" type="checkbox"/> separate signed power of attorney</li> <li><input type="checkbox"/> copy of general power of attorney; reference number, if any:</li> <li><input type="checkbox"/> statement explaining lack of signature</li> <li><input type="checkbox"/> priority document(s) identified in Box No. VI as item(s):</li> <li><input type="checkbox"/> translation of international application into (language):</li> <li><input type="checkbox"/> separate indications concerning deposited microorganism or other biological material</li> <li><input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form</li> <li><input type="checkbox"/> other (specify):</li> </ol>
--	--

Figure of the drawings which should accompany the abstract: Figure 3

Language of filing of the international application: ENGLISH

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

HELEN YEO & PARTNERS

For receiving Office use only		2. Drawings:	
1. Date of actual receipt of the purported international application:		<input type="checkbox"/> received:	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		<input type="checkbox"/> not received:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):			
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.		

Date of receipt of the record copy by the International Bureau:

For International Bureau use only

This sheet is not part of and does not count as a sheet of the international application.

**- PCT**  
**FEE CALCULATION SHEET**  
**Annex to the Request**

For receiving Office use only

International application No.

Applicant's or agent's  
file reference

YWC/99357629

Date stamp of the receiving Office

Applicant

KENT RIDGE DIGITAL LABS

**CALCULATION OF PRESCRIBED FEES**

1. TRANSMITTAL FEE . . . . . 135 T

2. SEARCH FEE . . . . . 313 S

International search to be carried out by AT

(If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)

**3. INTERNATIONAL FEE**

**Basic Fee**

The international application contains 22 sheets.

first 30 sheets . . . . . 820 b1

remaining sheets x additional amount = - b2

Add amounts entered at b1 and b2 and enter total at B . . . . . 820 B

**Designation Fees**

The international application contains 4 designations.

4 x 190 = 760 D

number of designation fees payable (maximum 10) amount of designation fee

Add amounts entered at B and D and enter total at I . . . . . 1580 I

(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at I is 25% of the sum of the amounts entered at B and D.)

4. FEE FOR PRIORITY DOCUMENT (if applicable) . . . . . P

5. TOTAL FEES PAYABLE . . . . . 2028

Add amounts entered at T, S, I and P, and enter total in the TOTAL box

TOTAL

☐ The designation fees are not paid at this time.

**MODE OF PAYMENT**

☐ authorization to charge  
deposit account (see below)

☐ bank draft

☐ coupons

☒ cheque

☐ cash

☐ other (specify):

☐ postal money order

☐ revenue stamps

**DEPOSIT ACCOUNT AUTHORIZATION** (this mode of payment may not be available at all receiving Offices)

The RO/ ☐ is hereby authorized to charge the total fees indicated above to my deposit account.

☐ (this check-box may be marked only if the conditions for deposit accounts of the receiving Office so permit) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

☐ is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.

## SECOND SCHEDULE — continued

PATENTS FORM 48

SINGAPORE  
PATENTS ACT  
(CHAPTER 221)  
PATENTS RULES

Rule 117

The Registrar,  
Registry of Patents.PAYMENT OF TRANSMITTAL FEE UNDER RULE 14 OF THE  
REGULATIONS UNDER THE PATENT CO-OPERATION TREATY

## NOTES:

1. This form should be completed by the applicant(s) who filed an international application for a patent (Singapore), who should enter his/their name(s) and address(es) and the number of the relevant International Application in the spaces provided.
2. Attention is drawn to rules 90 and 105 of the Patents Rules.

I/We .....	KENT RIDGE DIGITAL LABS
.....	21 Heng Mui Keng Terrace
.....	SINGAPORE 119613
.....	REPUBLIC OF SINGAPORE
the applicant(s) in respect of an international application for a patent (Singapore) filed under the Patent Co-operation Treaty, having international application No ..... transmit the transmittal fee payable in accordance with rule 14(1) of the Regulations under the Patent Co-operation Treaty in respect of my/our international application.	
Signature(s) .....	Date 18 March 1999
(See note 2)	
Name of Agent (if any) .....	HELEN YEO & PARTNERS
Address for service in Singapore to .....	11 Collyer Quay #12-01
which all communications should be sent .....	The Arcade, SINGAPORE
	049317

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY

## PCT

### NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence  
and Administrative Instructions, Section 601(a))

To:

HELEN YEO & PARTNERS  
11 Collyer Quay  
#12-01 The Arcade  
SINGAPORE 049317  
REPUBLIC OF SINGAPORE

Date of mailing  
(day/month/year) 3 November 2000 (03.11.00)

Applicant's or agent's file reference

YWC/99357629

#### IMPORTANT NOTIFICATION

International application No.

PCT/SG 99/00037

International filing date (day/month/year)

18 March 1999 (18.03.99)

Priority Date (day/month/year)

Applicant

KENT RIDGE DIGITAL LABS et al.

1. The applicant is hereby notified that this International Preliminary Examination Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

15 October 2000 (15.10.00)

2. ☒ The date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- ☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3.1(e)).
- ☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☐ **Attention:** The date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the PCT Applicant's Guide, Volume II.

- ☐ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/AT  
Austrian Patent Office  
Kohlmarkt 8-10  
A-1014 Vienna  
Facsimile No. 1/53424/200

Authorized officer

Koch

Telephone No. +43 / 1 / 53424 - 450

12/3/2007

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

CORRECTED VERSION

(19) World Intellectual Property Organization  
International Bureau

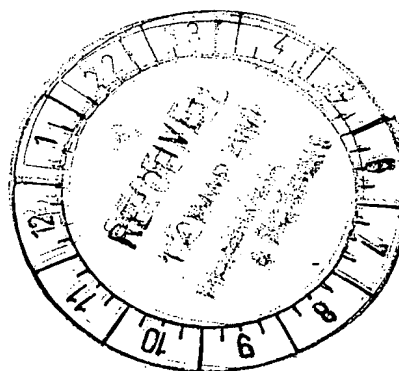


(43) International Publication Date  
21 September 2000 (21.09.2000)

PCT

(10) International Publication Number  
**WO 00/55740 A1**

- (51) International Patent Classification<sup>7</sup>: **G06F 13/00**, 15/177
- (74) Agent: **HELEN YEO & PARTNERS**; 80 Raffles Place, #33-00 UOB Plaza 1, Singapore 048624 (SG).
- (21) International Application Number: **PCT/SG99/00037**
- (81) Designated States (*national*): JP, SG, US.
- (22) International Filing Date: 18 March 1999 (18.03.1999)
- (84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
- (25) Filing Language: English
- (26) Publication Language: English
- Published:  
— With international search report.
- (71) Applicant (*for all designated States except US*): **KENT RIDGE DIGITAL LABS** [SG/SG]; 21 Heng Mui Keng Terrace, Singapore 119613 (SG).
- (48) Date of publication of this corrected version:  
1 March 2001
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **RANGARAJAN, Sridharan** [IN/SG]; Block 379, Clementi Avenue 5, #02-348, Singapore 120379 (SG). **LIN, Feng** [CN/SG]; Block 110, Woodlands Street 13, #12-20, Singapore 730110 (SG). **PANG, Hwee, Hwa** [SG/SG]; 19 Shelford Road, #01-42, Singapore 288408 (SG).
- (15) Information about Correction:  
see PCT Gazette No. 09/2001 of 1 March 2001, Section II
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*



(54) Title: SOFTWARE DISTRIBUTION, EXECUTION AND UPGRADING

(57) Abstract: A method of distributing software over a communication network includes the steps of: making the software available on a file server attached to the network; providing and executing an installation application on a user's computer attached to the network; monitoring file requests made by the installation application; identifying file requests which relate to files which are not present on the user's computer; downloading the identified files from the file server; storing the downloaded files in storage media on the user's computer; and directing the file requests for the identified files, and any future file requests for those files, to the downloaded versions of those files. Similar methods are provided for executing software over a network and upgrading software over a network.

WO 00/55740 A1

CORRECTED VERSION

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
21 September 2000 (21.09.2000)

PCT

(10) International Publication Number  
**WO 00/55740 A1**

- (51) International Patent Classification<sup>7</sup>: **G06F 13/00, 15/177**
- (21) International Application Number: **PCT/SG99/00037**
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(54) Title: **SOFTWARE DISTRIBUTION, EXECUTION AND UPGRADING**

(57) Abstract: A method of distributing software over a communication network includes the steps of: making the software available on a file server attached to the network; providing and executing an installation application on a user's computer attached to the network; monitoring file requests made by the installation application; identifying file requests which relate to files which are not present on the user's computer; downloading the identified files from the file server; storing the downloaded files in storage media on the user's computer; and directing the file requests for the identified files, and any future file requests for those files, to the downloaded versions of those files. Similar methods are provided for executing software over a network and upgrading software over a network.



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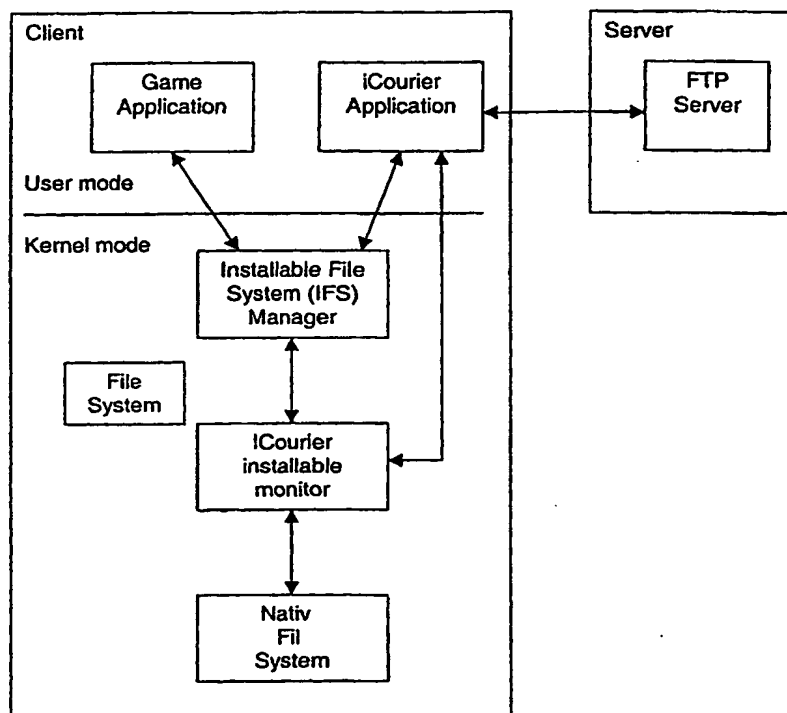
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(54) Title: SOFTWARE DISTRIBUTION, EXECUTION AND UPGRADING

## (57) Abstract

A method of distributing software over a communication network includes the steps of: making the software available on a file server attached to the network; providing and executing an installation application on a user's computer attached to the network; monitoring file requests made by the installation application; identifying file requests which relate to files which are not present on the user's computer; downloading the identified files from the file server; storing the downloaded files in storage media on the user's computer; and directing the file requests for the identified files, and any future file requests for those files, to the downloaded versions of those files. Similar methods are provided for executing software over a network and upgrading software over a network.



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## SOFTWARE DISTRIBUTION, EXECUTION AND UPGRADING

This invention relates to methods for distribution, execution and upgrading of software. It relates particularly but not exclusively to methods for executing and distributing software over a communication network such as a local area network, a wide area network, a virtual private network, or the Internet.

Most current application software consists of a large number of different files. Such software is typically distributed on one or more CD-ROMs. The software is installed on a user's computer by running a set-up or installation program, which writes different files to different directories or folders on storage media (such as a hard disk) on the user's computer. When the software application is executed, it makes file requests to the various different files as they are needed. The file requests are typically made to a particular file directory location on the user's computer, and the software may cease to operate properly if a file is not found in the expected location. For some software, the file requests are made to a CD-ROM drive on the user's computer, and the software may cease to operate properly if the correct CD-ROM is not present in the drive.

Disadvantages of software distribution using CD-ROMs or other physical distribution media include the costs of creating the CD-ROMs, the effort and expense involved in creating printed manuals and packaging, and the time delays and transportation logistics involved in physically delivering the media to the user. Different users have different configurations of computers and different requirements for software functionality. Accordingly, different users require slightly different (sometimes significantly different) versions of the same software, and in order to achieve this the software manufacturer typically includes all possible variations on the distribution media, with the user selecting the applicable components during installation. From the user's point of view, there is the inconvenience of receiving more materials than may be required. Typically, a user never finds a use for all of the software which is received, and the functionality of the software far exceeds what is required. After a while, superseded CD-ROMs take up useful space. The user may have to pay for and install the whole of a software package when all that was required was a small part of it, and the user may have preferred to pay a lesser amount for software which takes up less data storage space on the user's computer. Moreover, a user who uses the software

only occasionally has to pay the same amount as a person who uses the software frequently.

It is becoming increasingly common to distribute software over the Internet. This is typically done by collecting all the files for a software application together  
5 into a compressed archive, making the archive available on an FTP or Web server on the Internet, and downloading the archive from the FTP or Web server onto the user's computer. The user then runs an installation program which decompresses the archive to extract the files, and then writes different files to different directories on the hard disk of the user's computer in much the same way as the installation  
10 program on a CD-ROM operates.

Apart from the issues of wastage and delivery of physical media, this method of delivery of software includes many of the disadvantages of conventional physical delivery. It is still usually necessary for the user to download more files than are actually required for the user's particular configuration, and this can be  
15 problematic in view of the time costs typically associated with connecting to the Internet. There is no means for charging the user only for the parts of the software which are actually useful to the user, or for charging the user on the basis of the frequency with which the software is used. Moreover, once a complete archive of the relevant software has been downloaded by the user, it is relatively easy for the  
20 user to make and distribute unauthorised copies, so piracy issues arise.

A further problem associated with conventional software distribution methods relates to the manner in which the user decides whether the software is suitable for the user's purposes. It is typically very difficult for a user to decide whether software is suitable merely from reading advertising material, and the  
25 suitability can in many cases only be verified some time after the user has purchased the software and gone through the effort necessary to learn how to use it. This can result in a user purchasing unsuitable software. One answer to this problem is provided by cut-down "demonstration" versions of the software which may be distributed at low cost or free of charge via physical media (such as on  
30 CD-ROMs sold with computer magazines) or over the Internet. However, because it is usually necessary for a user to invest a significant amount of time in installation and learning how to use a new software application, there is often a reluctance to spend the time necessary to install and learn how to use a cut-down software product which will never in itself be useful.

Another type of software distribution is involved in client-server networking, typically in the context of local area networks. A typical local area network involves a number of client computers connected to one or more file servers. Networking software located on a client computer and the file server enables the client  
5 computer to gain access to files on the file server as if the files were located on a disk drive on the client computer. From the client computer's point of view, the file server simply appears to be one or more additional file volumes on the client computer. As a result, it is possible to run client-server software applications, in which some of the files are located on the client computer and some are located  
10 on the file server. In peer-to-peer networking, a similar result is achieved in a system where each computer can be configured to allow the other computers in the network to have access to part or all of its disk volumes.

An advantage of client-server networking and peer-to-peer networking is that it is not necessary for each computer in the network to have a complete copy  
15 of all the files of the software application; shared files need only be present on one computer. Accordingly, computer storage media space is not wasted, and upgrading can be a simpler process. However, this type of networking can typically only be achieved within an organisation which has the same networking software on all computers. Efficiencies can be gained in distributing software within an  
20 organisation, but not between organisations or to individuals which are not part of the organisation.

US Patent 5,752,005 describes a foreign file system establishing method which uses a native file system virtual device driver. A computer has a native file system which provides various native function routines. A virtual driver  
25 communicates with the native file system and intercepts some of the function routines, transferring them to a particular location on another ("foreign") computer. This allows the computer to gain some of the advantages of client-server networking, but it is necessary for the device driver to emulate the foreign file system.

30 An object of the present invention is to provide new methods of distributing, executing and upgrading software which overcome some or all of the difficulties described above.

According to a first aspect of the invention, there is provided a method of distributing software over a communication network including the steps of:

- (a) making the software available on a file server attached to the network;
- (b) providing and executing an installation application on a user's computer attached to the network;
- (c) monitoring file requests made by the installation application;
- 5 (d) identifying file requests which relate to files which are not present on the user's computer;
- (e) downloading the identified files from the file server;
- (f) storing the downloaded files in storage media on the user's computer; and
- (g) directing the file requests for the identified files, and any future file requests
- 10 for those files, to the downloaded versions of those files.

The communication network may be any suitable form of communication network. Suitable communication networks include the Internet, a local area network, a wide area network, and a virtual private network. It is currently envisaged that the invention will be used most extensively in the context of

15 distribution of software over the Internet. It will be seen that one of the advantages of this aspect of the invention is that a user downloads only the files which are required by the user.

The file server may be any suitable type of file server. Suitable types of file servers, with particular reference to Internet applications, include an FTP server,

20 and HTTP server and a Gopher server.

The method of this aspect of the invention may further include the steps of:

- (h) monitoring the number of times that files are requested and/or the particular files requested by the user's computer from the server; and
- (i) requiring the owner of the user's computer to make payments based on the
- 25 number of times that files are requested and/or the particular files requested.

These steps enable the software manufacturer to charge a differential price to users based on the amount of the software which the user actually uses and/or on the frequency of use. Accordingly, a person who uses only a small part of the software or who uses it only occasionally can be charged a smaller fee, whereas a

30 person who uses more extensive parts of the software or uses it frequently can be charged a higher fee.

During the installation process, the software may optionally require that a key be entered.

One of the advantages of the first aspect of the invention is that it can allow distribution of currently available software without any modification of the file requests made by that software. This is because file requests are intercepted. If the file is already on the user's computer, the file request is directed to that file. If the file is not on the user's computer, the file is downloaded from the file server and then accessed on the user's computer. Currently available software might make numerous file requests to the local CD-ROM drive, because the software has been programmed with the assumption that the software is being installed from a local CD-ROM. All of these requests are monitored and converted into file download requests directed to the file server or redirected to downloaded files located on the user's computer.

According to a second aspect of the invention, there is provided a method of executing computer application software on a user's computer which is connected to a communication network including the steps of:

- (a) providing on the user's computer a version of the software which does not include all the files necessary for complete operation of the software;
- (b) making the missing files available on a file server attached to the network;
- (c) executing the software on the user's computer;
- (d) monitoring file requests made by the software;
- (e) identifying file requests which relate to files which are not present on the user's computer;
- (f) downloading the identified files from the file server and storing them in volatile or non-volatile storage media on the user's computer;
- (g) directing the file requests for the identified files to the downloaded versions of those files; and
- (h) deleting one or more of the downloaded files from the user's computer.

The communication network and the file server may have the same features as described above in relation to the first aspect of the invention.

The step of deleting one or more of the downloaded files may be done at any suitable time, including:

- (i) as the files are closed by the software;
- (ii) when execution of the software terminates;
- (iii) after a pre-determined time or number of days has elapsed; and/or
- (iii) after the software has been executed a pre-determined number of times.

The method of this aspect of the invention may further include the steps of:

- (i) monitoring the number of times that files are requested and/or the particular files requested by the user's computer from the server; and
- (j) requiring the owner of the user's computer to make payments based on the number of times that files are requested and/or the particular files requested.

It will be seen that this method requires the user's computer to make contact with the file server at regular intervals in order to replace deleted files, and this facilitates the pay-per-use type of charging. This method is also useful for overcoming the purchasing barrier – allowing users to try the actual software first before buying it. There is no need for the software to be a cut-down version.

According to a third aspect of the invention, there is provided a method of automatically upgrading software on a user's computer over a communication network including the steps of:

- (a) making the upgrade software available on a file server attached to the network;
- (b) ascertaining that the software on the user's computer is an older version than the upgrade software;
- (c) executing the software on the user's computer and monitoring file requests made by the software;
- (d) identifying file requests which relate to files which have been upgraded in the upgrade software;
- (e) downloading the identified files from the file server;
- (f) storing the downloaded files in storage media on the user's computer; and
- (g) directing the file requests for the identified files, and any future file requests for those files, to the downloaded versions of those files.

The communication network and the file server may have the same features as described above in relation to the first aspect of the invention.

The step of ascertaining that the software on the user's computer is an older version than the upgrade software may occur at any suitable time, including:

- (i) each time the software on the user's computer is executed;
- (ii) after the software on the user's computer has been executed a predetermined number of times; or
- (iii) after a predetermined period of time.



When it is ascertained that the software on the user's computer is an older version than the upgrade software, an upgrade agent may be downloaded from the file server to the user's computer. The upgrade agent performs the function of monitoring file requests made by the software to identify file requests which relate to files which have been upgraded in the upgrade software.

The invention will hereinafter be described in greater detail by reference to the attached drawings which show an example form of the invention. It is to be understood that the particularity of those drawings does not supersede the generality of the preceding description of the invention.

Figure 1 is a block diagram showing schematically the software components in a conventional networking system.

Figure 2 is a block diagram showing schematically the software components in a networking system according to the present invention.

Figure 3 is a schematic diagram of the components in a preferred embodiment of the present invention.

Referring firstly to Figure 1, there is shown the components in conventional directory mounting/mapping products such as NFS, SMB and NetWare. On the host machine, application software runs on top of an operating system. The application software communicates with the operating system through various application program interfaces (APIs). Included within the operating system are a native file system, which includes a multiplicity of function routines, and network drivers. On the remote computer, the operating system also includes a file system and network drivers. When the application software on the host machine accesses a file on the remote machine, it does so by making a request to the file system on the host machine. This request then passes to the network driver on the host machine, which passes the request to the network driver on the remote machine, which in turn passes it to the file system on the remote machine to access the file. The response is sent back through the same communication chain. There is no trapping of file requests made from the application software before they reach the native file system. Instead, the native file system invokes special drivers called network redirectors, which co-operate with their counterparts on the remote machine to make the directories and files visible to the native file system.

Referring now to Figure 2, the present invention enables software to be installed and run on a host machine, without requiring the underlying files to be

physically available on any of the local storage drives. Instead, every file request from the software is trapped by an installable monitor, which dynamically downloads the target file from a remote file server to a local storage medium if the file has not already been downloaded. The installable monitor thereafter directs the native file system to operate on the downloaded file in order to satisfy the file request. Even requests for a file at an absolute path on a specific drive (e.g. the CD-ROM drive) are redirected to the downloaded file, which is likely to reside at a different path on a different drive. The downloaded file can optionally be removed when the software closes the file, or when the software terminates. Consequently, a host machine can run application software without having a physical medium containing all the underlying files.

In a preferred embodiment as illustrated in Figure 3, the file server is a standard FTP server using the FTP communication protocol. The communication network is the Internet. The user's computer has Windows 95 as its operating system, and the FTP server has Solaris as its operating system. However, those skilled in the art should appreciate that different operating systems have similar features and functions, so that the present invention is not limited to use only in connection with these operating systems.

The installable monitor on the user's computer has two components: a virtual device driver (VxD) inside the operating system kernel, and a Windows application at the user level, which includes an FTP client (the user mode application). The VxD is implemented in such a way that it layers itself on top of the native file system. It is implemented as a hook that gets installed below the installable file system (IFS) manager interface. A hook is a programming device that alters program flow away from its original intent. Consequently, for selected program flow threads progressing through the IFS manager interface, program flow is routed to the VxD rather than to the native file system as originally intended. The VxD is then free to either satisfy the request and return program flow back to the requesting thread or modify the request before directing it to the native file system.

The native file system may include function routines directed towards file rights, file locking, file transaction tracking and the like. These are of little importance to the installable monitor of the invention, and hence hooks are omitted

for such functions. The selected functions for which hooks are implemented in the preferred embodiment are indicated in the following table:

CreateFile	WriteFile	FindNextFile
CloseFile	GetFileSize	GetFileAttributes
ReadFile	FindFirstFile	GetFileTime
CreateDirectory	DeleteFile	

5           The precise processes and program flow used in hooking these function routines are unimportant for the purposes of the present invention. Such hooking may be implemented any number of different ways, as will be known to those skilled in the art. For example, published information describing the operating system may indicate the definition of the IFS manager interface for various  
10 function routines supported by the native file system. To the extent that published information is lacking, hook locations may be determined empirically.

For each function routine that is hooked, the VxD blocks the execution of the request inside the kernel, determines the path name of the request issued by the CD application and translates it into the equivalent remote path name on the  
15 CD drive attached to the file server. This remote path name is then passed back to the user mode application using known event notification mechanisms. The user mode application then translates the request into an FTP request and forwards it to the FTP server. The user mode application waits for a response from the FTP server and, once the file has been downloaded onto the user's machine, it saves  
20 the file to another location on the user's machine's local storage media. Confirmation of the download is passed to the VxD, together with the location of the local copy of the file. The VxD then redirects the native file system to satisfy the request made by the application using the local copy, and the application continues as normal. The application itself is unaware that its files and data are  
25 being accessed on-line rather than on a local CD-ROM. After the application finishes execution, or closes the file, or after a pre-determined number of uses or after a pre-determined number of days, (these options may be configurable) one or more or all of the downloaded files are deleted from the user's machine.

Typical applications for this embodiment include games traditionally  
30 distributed via CD-ROM disks. The start-up program corresponds to the game

application that is launched on the user's machine. Typically these applications store their data in the form of movie files on the CD-ROM disk. These are downloaded on demand by the installable monitor on the user's computer, while the user continues to play the game.

- 5           It is to be understood that various alterations, modifications and additions can be made to the parts previously described without departing from the ambit of the invention.

## Claims:

1. A method of distributing software over a communication network including the steps of:
  - 5 (a) making the software available on a file server attached to the network;
  - (b) providing and executing an installation application on a user's computer attached to the network;
  - (c) monitoring file requests made by the installation application;
  - (d) identifying file requests which relate to files which are not present on the  
10 user's computer;
  - (e) downloading the identified files from the file server;
  - (f) storing the downloaded files in storage media on the user's computer; and
  - (g) directing the file requests for the identified files, and any future file requests for those files, to the downloaded versions of those files.
- 15 2. A method according to claim 1 further including the steps of:
  - (h) monitoring the number of times that files are requested and/or the particular files requested by the user's computer from the server; and
  - (i) requiring the owner of the user's computer to make payments based on the  
20 number of times that files are requested and/or the particular files requested.
3. A method according to claim 1 wherein the software requires a key to be entered during installation.
- 25 4. A method according to claim 1 wherein the communication network is the Internet.
5. A method according to claim 1 wherein the communication network is a local area network or a private wide area network.
- 30 6. A method according to claim 1 wherein the file server is:
  - (i) an FTP server;
  - (ii) an HTTP server; or
  - (iii) a Gopher server.

7. A method of executing computer application software on a user's computer which is connected to a communication network including the steps of:
- (a) providing on the user's computer a version of the software which does not  
5 include all the files necessary for complete operation of the software;
  - (b) making the missing files available on a file server attached to the network;
  - (c) executing the software on the user's computer;
  - (d) monitoring file requests made by the software;
  - (e) identifying file requests which relate to files which are not present on the  
10 user's computer;
  - (f) downloading the identified files from the file server and storing them in volatile or non-volatile storage media on the user's computer;
  - (g) directing the file requests for the identified files to the downloaded versions of those files; and
  - 15 (h) deleting one or more of the downloaded files from the user's computer.
8. A method according to claim 7 wherein the step of deleting one or more of the downloaded files is done:
- (i) as the files are closed by the software;
  - 20 (ii) when execution of the software terminates;
  - (iii) after a pre-determined time or number of days has elapsed; and/or
  - (iii) after the software has been executed a pre-determined number of times.
9. A method according to claim 7 further including the steps of:
- 25 (i) monitoring the number of times that files are requested and/or the particular files requested by the user's computer from the server; and
  - (j) requiring the owner of the user's computer to make payments based on the number of times that files are requested and/or the particular files requested.
- 30 10. A method according to claim 7 wherein the communication network is the Internet.
11. A method according to claim 7 wherein the communication network is a local area network or a private wide area network.

12. A method according to claim 7 wherein the file server is:
- (i) an FTP server;
  - (ii) an HTTP server; or
  - 5 (iii) a Gopher server.
13. A method of automatically upgrading software on a user's computer over a communication network including the steps of:
- (a) making the upgrade software available on a file server attached to the  
10 network;
  - (b) ascertaining that the software on the user's computer is an older version than the upgrade software;
  - (c) executing the software on the user's computer and monitoring file requests made by the software;
  - 15 (d) identifying file requests which relate to files which have been upgraded in the upgrade software;
  - (e) downloading the identified files from the file server;
  - (f) storing the downloaded files in storage media on the user's computer; and
  - (g) directing the file requests for the identified files, and any future file requests  
20 for those files, to the downloaded versions of those files.
14. A method according to claim 13 wherein the step of ascertaining that the software on the user's computer is an older version than the upgrade software occurs:
- 25 (i) each time the software on the user's computer is executed;
  - (ii) after the software on the user's computer has been executed a predetermined number of times; or
  - (iii) after a predetermined period of time.
- 30 15. A method according to claim 13 wherein, when it is ascertained that the software on the user's computer is an older version than the upgrade software, an upgrade agent is downloaded from the file server to the user's computer and the upgrade agent performs the function of monitoring file requests made by the

software to identify file requests which relate to files which have been upgraded in the upgrade software.

16. A method according to claim 13 wherein the communication network is the Internet.

17. A method according to claim 13 wherein the communication network is a local area network or a private wide area network.

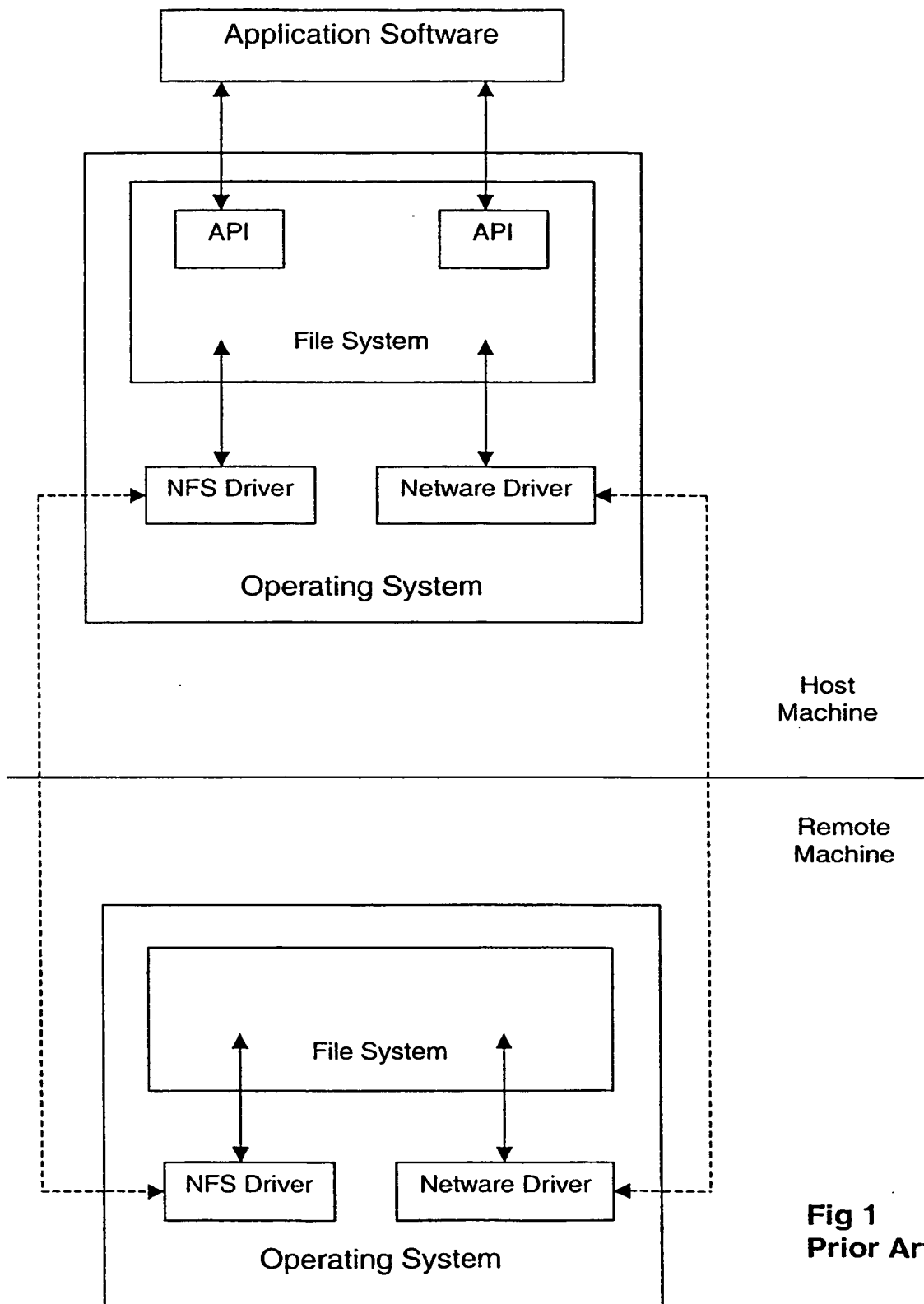
10 18. A method according to claim 13 wherein the file server is:

- (i) an FTP server;
- (ii) an HTTP server; or
- (iii) a Gopher server.



1 / 3

DRAWINGS



**Fig 1**  
**Prior Art**

2 / 3

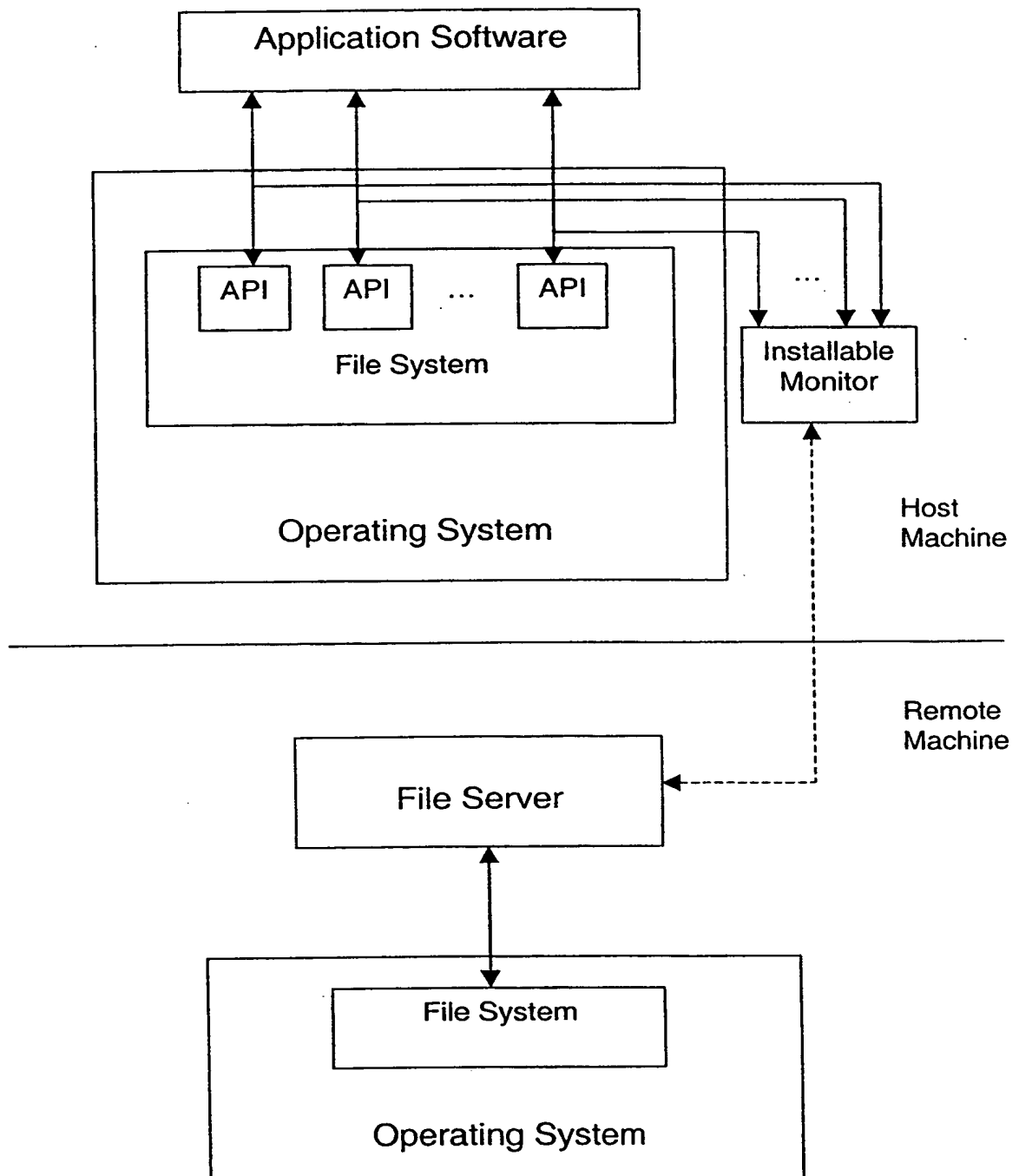


Fig 2

3 / 3

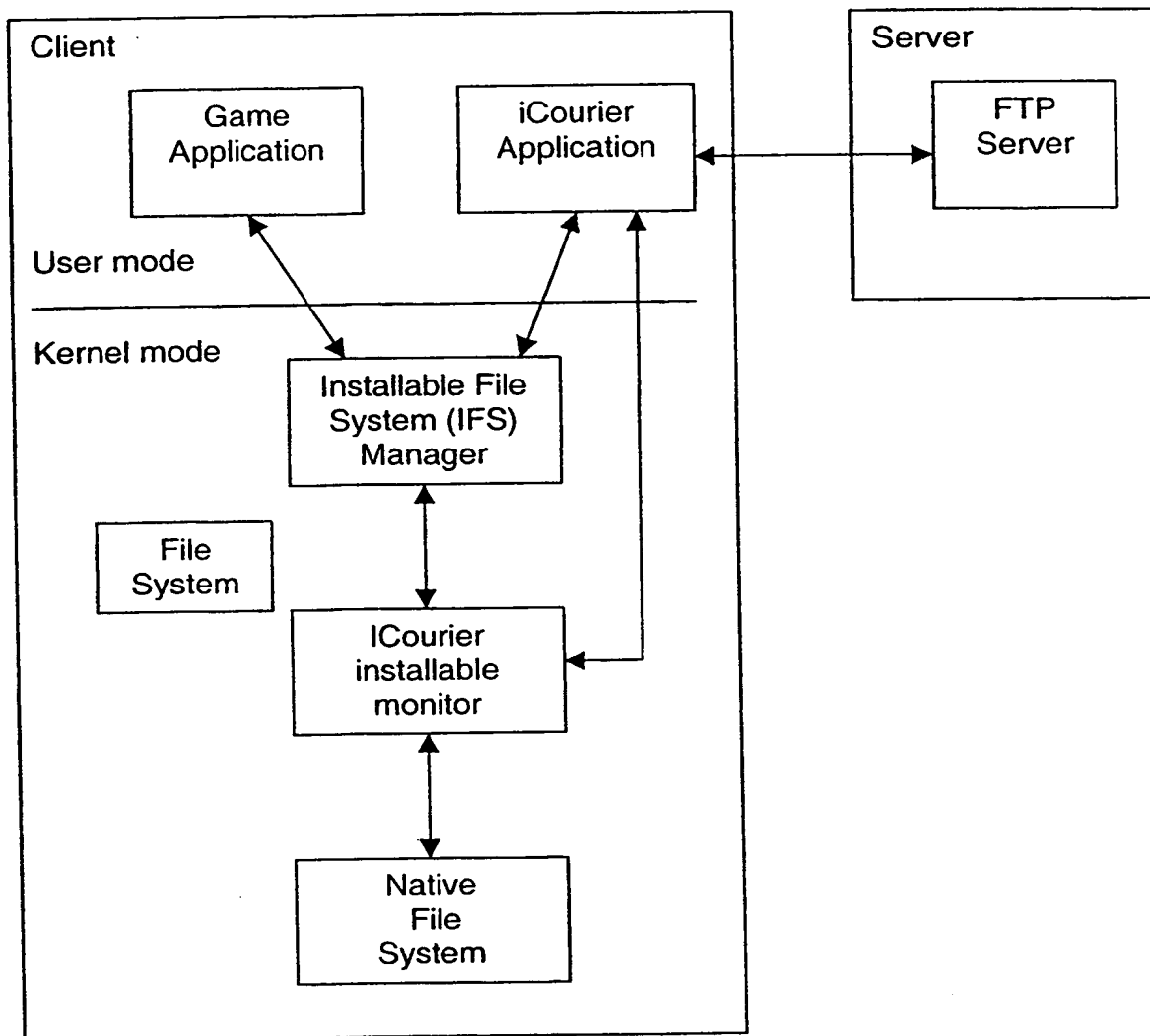


Fig 3

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SG 99/00037

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: G 06 F 13/00, 15/177

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: G 06 F; H 04 L; H 04 Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5421009 A (HEWLETT-PACKARD) 30 May 1995 (30.05.95) abstract	1-6,13-18
A	WO 96/24231 A1 (ERICSSON) 8 August 1996 (08.08.96) totality.	1-18
A	US 5845077 A1 (MICROSOFT) 1 December 1998 (01.12.98) abstract.	1-6,13-18
A	US 5881236 A (HEWLETT-PACKARD) 9 March 1999 (09.03.99) abstract.	1-6
A	JP 10-269078 A (TOSHIBA K.K.) 9 October 1998 (09.10.98) abstract.	1-6

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

23 August 2000 (23.08.2000)

Date of mailing of the international search report

23 August 2000 (23.08.2000)

Name and mailing address of the ISA/AT

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG 99/00037

Patent document cited in search report			Publication date	Patent family member(s)		Publication date	
JP	A2	10269078	09-10-1998	none			
US	A	5421009	30-05-1995	none			
US	A	5845077	01-12-1998	US	A	6073214	06-06-2000
US	A	5881236	09-03-1999	DE	A1	19714521	06-11-1997
				JP	A2	10091454	10-04-1998
WO	A1	9624231	08-08-1996	AU	A1	46379/96	21-08-1996
				AU	B2	702231	18-02-1999
				CA	AA	2211733	08-08-1996
				EP	A1	807363	19-11-1997
				FI	A0	973143	29-07-1997
				FI	A	973143	29-09-1997
				JP	T2	11501136	26-01-1999